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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BROOME, SAID A	

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/751,328	XIE ET AL.	
	Examiner	Art Unit	
	Said Broome	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 6-15, 16-19, 23-25 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouet et al.(US Patent 5,758,046) in view of Brinsmead(US Patent 5,764,233).

Regarding the preamble of claims 1 and 24, Rouet et al. teaches a computer-implemented method and system for animating an image in column 2 lines 53-58, that is based on a scene description that includes one or more geometric objects, as described in column 4 lines 57-60, and one or more particle systems, which are collections of independent objects, as described in column 1 lines 53-58. Regarding claims 1 and 24, Rouet et al. teaches all the limitations except rendering particle systems with the cutout particles to generate a particle image. Rouet et al. teaches generating a plurality of cutout particles, which are particles that correspond to a geometric object in the scene description, in column 1 lines 53-56 and column 4 lines 23-27, where it is described that hair particles correspond to the geometric model of the surface of skin or a scalp as illustrated in Figure 3a as element 300. Rouet et al. also teaches cutout particles that occlude particles of the particle systems in column 8 lines 28-31, where it is described that hair particles occlude other objects within the scene. Rouet et al. also teaches composting the particle image with an image of the geometric objects, or three dimensional scene elements, to create a composited image in column 2 lines 3-7 and column 7 lines 27-34. Again, Rouet et al.

fails to teach rendering particle systems with the cutout particles to generate a particle image. Brinsmead teaches rendering particle systems, or collections of independent objects, with the cutout particles to generate a particle image in column 4 lines 18-28. It would have been obvious to one of ordinary skill in the art to combine the teachings of Rouet et al. with Brinsmead because this combination would provide visually accurate and efficient generation of particles that are non-occluded and composited with geometric objects and backgrounds.

Regarding claims 2 and 25, Rouet et al. teaches rendering the geometric objects to produce a depth map, the depth map including a plurality of entries that each indicate a distance to a nearest geometric object from a camera position in a particular direction in column 2 lines 3-7 and column 6 lines 36-41. Rouet et al. also teaches generating cutout particles from at least some of the entries in the depth map where each cutout particle corresponds to an entry in the depth in three-dimensional space in column 7 lines 35-40.

Regarding claim 6, Rouet et al. teaches that at least for some particles, or object elements, and at least some of the cutout particles, or hair particles, performing a composting operation to determine a coloring or an occluding effect of the particle on one or more pixels of the particle image in column 2 lines 3-8 and column 7 lines 35-46.

Regarding claim 7, Rouet et al. teaches performing the compositing operation for the particles from the farthest particle from a camera position to the nearest particle in column 6 lines 35-41, where it is described that each particle is recorded in a list that contains each particle's depth information and ranks the particles based on the visibility of the particle, as described in column 7 lines 42-58, therefore it would be possible to use the depth information to

perform compositing from the farthest particle to the nearest by using each particle's depth information.

Regarding claim 8, Rouet et al. teaches all the limitations except the particles of the particle system having coloring effects on at least one pixel of the particle image. Rouet et al. teaches cutout particle shaving occluding effects on at least one pixel of the particle image in column 6 lines 9-10. Rouet et al. also teaches a coloring effect that accumulates or collects color for the pixel in column 6 lines 17-21. Rouet et al. teaches an occluding effect that blocks accumulated color for the pixel in column 6 lines 23-27. Again, Rouet et al. fails to teach the particles of the particle system having coloring effects on at least one pixel of the particle image. Brinsmead teaches the particles of the particle system having coloring effects on at least one pixel of the particle image in column 2 lines 2-5 and 19-20. It would have been obvious to one of ordinary skill in the art to combine the teachings of Rouet et al. with Brinsmead because this combination would provide accurate rendering of visible particles and their associated colors.

Regarding claims 9 and 28, Rouet et al. teaches combining the particles from the particle systems and the cutout particles in a list in column 7 lines 54-58, where it is described that the hair particles, which are known in the art to comprise collections of independent objects or particle systems, are put in a list in which they are sorted or ranked, as described in column 7 lines 52-58, by using each particle depth information as described in column 6 lines 36-41 and is also illustrated in Figure 7. Rouet et al. also teaches that for each particle in the list, from farthest to nearest based on the depth information and visibility of the particle, a coloring or occluding effect is determined on one or more pixels of the particle image, as described in column 8 lines 27-31.

Regarding claims 10 and 29, Rouet et al. teaches combining the coloring effects of geometric objects, or particles, in column 3 lines 13-18 and the occluding effects of the cutout particles or hair particles to determine the color of a plurality of pixels in column 6 lines 23-27 and column 8 lines 28-31.

Regarding claim 11, Rouet et al. teaches resolving the coloring effects of particles and occluding effects of the cutout particles based on the depth of the particles in column 6 lines 20-27, where it is described that the color of the visible regions are determined based on the determined depth information.

Regarding claims 12 and 31, Rouet et al. teaches compositing comprising alpha blending, or controlling the levels of opacity, the particle image with a rendered image of the geometric objects in column 7 line 47-56, where it is described that the opacity of each particle is determined and is controlled through calculation of the opacity within some threshold value as described in column 7 lines 58-60, when the particle image is composited with a rendered image.

Regarding claim 13, Rouet et al. teaches determining which pixels in the particle image the particle covers and an amount of the pixel covered as seen from a camera position in column 5 lines 56-67 and column 6 lines 1-5.

Regarding claim 14, Rouet et al. teaches computing a depth of field adjustment for a cutout particle in column 3 lines 63-67, where it is described that the depth of field, or focus, is adjusted based on the viewpoint of the particle elements.

Regarding claim 15, Rouet et al. teaches computing motion blur adjustment for a cutout particle in column 8 lines 27-31.

Regarding the preamble of claim 16, Rouet et al. teaches a computer-implemented method, in column 2 lines 53-58, for rendering one or more particle systems to produce a particle image to be combined or composited with a second image, as described in column 2 lines 3-7. Regarding claim 16, Rouet et al. teaches a plurality of cutout particles, or hair particles that are associated with a three-dimensional position of a geometric surface, as described in column 3 lines 1-4, are generated in a second resulting two-dimensional image as described in column 7 lines 2-34. Regarding claims 16 and 30, Rouet et al. also teaches for each of a plurality of pixels in the particle image, computing a list of coverage layers for the pixel in column 6 lines 36-42 where it is described that a coverage layer, which is a layer that include a color and occlusion parameter for the particle, is computed into a list. Rouet et al. also teaches determining the color of the pixel based on the associated coverage layer in column 6 lines 36-39.

Regarding claim 17, Rouet et al. teaches generating a list of coverage layers which comprise depth information for each particle and rank them based on their visibility, therefore it would be possible to rank the list, as illustrated in Figure 7, in order from farthest to nearest.

Regarding claim 18, Rouet et al. teaches a adding a new coverage layer for a particle that follows a cutout particle in the processing in column 6 lines 24-27 and 34-41, where it is described that a new coverage layer, or color and occlusion parameter, is computed for elements or particles that occlude previously processed particles.

Regarding claim 19, Rouet et al. teaches computing a depth map for the second two-dimensional image in column 7 lines 35-44. Rouet et al. also teaches generating a cutout particle for at least some entries in the depth map in column 8 lines 24-31 where it is also described that

the cutout particle has a position in the three-dimensional space corresponding to the depth map entry.

Regarding claim 23, Rouet et al. teaches a computer program product comprising a computer-readable medium containing computer program code for performing the method of claim 2 in column 2 lines 42-59 and is illustrated in Figure 1.

Claims 3-5, 20-22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouet et al.(US Patent 5,758,046) in view of Brinsmead(US Patent 5,764,233) in further view of Klassen (US Patent 6,591,020).

Regarding claims 3 and 21, Rouet et al. and Brinsmead teach all the limitations except that the cutout particles are generated at a higher resolution than the particle image. Klassen teaches in column 1 lines 64-67 and column 2 lines 1-14 generating certain contents of an image at higher resolution than other contents of the image so as to perform an antialiasing technique, therefore one of ordinary skill in the art would be capable of generating the cutout particles at a higher resolution than the particle image. It would have been obvious to one of ordinary skill in the art to combine the teachings of Rouet et al. and Brinsmead with Klassen because this combination would provide a technique for preventing distorted portions of a generated image.

Regarding claims 4, 5, 20, 22 and 26, Rouet et al. teaches cutout particles containing depth information in column 6 lines 36-41. Rouet et al. and Brinsmead fail to teach cutout particles generated at a higher resolution than the particle image along any silhouette edges of the depth map. Klassen teaches generating certain contents of an image at higher resolution than other contents of the image to prevent jagged appearances, particularly in along the edges of the

image where aliasing is likely to occur. Therefore one of ordinary skill in the art would be capable of generating the cutout particles at a higher resolution than the particle image along the edges of the depth map taught by Rouet et al. It would have been obvious to one of ordinary skill in the art to combine the teachings of Rouet et al. and Brinsmead with Klassen because this combination would provide a technique for preventing distorted portions along the edges of a generated image where aliasing is likely to occur.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Said Broome whose telephone number is (571)272-2931. The examiner can normally be reached on 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Broome
1/13/2006 SB

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